

REMARKS

In the Notice of Non-Responsive Amendment, the Examiner indicated that Applicants previously canceled some claims and then reintroduced these claims without providing arguments regarding a prior rejection of the claims set forth in a previous Office Action, dated May 28, 2003. The Examiner required either cancellation of these claims or arguments as to how the claims are different from the references applied in the previous Office Action, namely Khacherian et al. (U.S. Patent No. 5,768,257) and Koning et al. (U.S. Patent No. 6,125,112).

By this Response to the Notice of Non-Responsive Amendment, Applicants amend claims 45, 67-70, 80, and 86 to improve form. Claims 44-87 remain pending. Applicants respectfully submit that claims 44-87 are patentable over Khacherian et al. and Koning et al., whether taken alone or in any reasonable combination.

Independent claim 44, for example, is directed to a line card in a system for transferring data packets, where the system includes a plurality of line cards. The line card comprises a request generator to generate a request signal to be transmitted to a destination line card in order to receive a grant signal authorizing transferring of data to the destination line card; a data cell transmitter to transmit a data cell to the destination line card upon receipt of the grant signal from the destination card; and transmit logic to receive a grant signal and a data cell which are unrelated to each other from a grant generator and the data cell transmitter, respectively, and transmit the grant signal and the data cell together in a data transfer unit.

Neither Khacherian et al. nor Koning et al., whether taken alone or in any reasonable combination, discloses or suggests the combination of features recited in claim 44. For example, neither Khacherian et al. nor Koning et al. discloses or suggests transmit logic to receive a grant

signal and a data cell which are unrelated to each other from a grant generator and the data cell transmitter, respectively, and transmit the grant signal and the data cell together in a data transfer unit. Instead, Khacherian et al. discloses transmitting a grant to release signal and a discrete information unit separately (col. 4, lines 33-55). Similarly, Koning et al. discloses transmitting a grant signal and data separately (col. 2, lines 16-32).

For at least these reasons, Applicants submit that claim 44 is patentable over Khacherian et al. and Koning et al., whether taken alone or in any reasonable combination.

Amended independent claim 45 is directed to a switching device for transferring data packets. The switching device comprises one or more source line cards, each including a request generator to generate a request signal to be transmitted in order to obtain an authorization to transmit data; one or more destination line cards, each including a grant generator to generate and send back a grant signal to a source line card in response to the request signal received at a destination line card to authorize the source line card to transmit a data cell to the destination line card; and a switching fabric coupled to the source line card and the destination line card, the switching fabric being configured to receive and transmit the request signal, the grant signal, and the data cell to the appropriate line cards, where the switching fabric is configured to transmit at least two of a request signal, a grant signal, or a data cell together in a single data transfer unit.

Neither Khacherian et al. nor Koning et al., whether taken alone or in any reasonable combination, discloses or suggests the combination of features recited in claim 45. For example, neither Khacherian et al. nor Koning et al. discloses or suggests a switching fabric coupled to the source line card and the destination line card, the switching fabric being configured to receive and transmit the request signal, the grant signal, and the data cell to the appropriate line cards,

where the switching fabric is configured to transmit at least two of a request signal, a grant signal, or a data cell together in a single data transfer unit. Instead, Khacherian et al. discloses a switch fabric that transmits a request to release signal, a grant to release signal, and a discrete information unit separately (col. 4, lines 33-55). Similarly, Koning et al. discloses a multistage switch that transmits a request signal, a grant signal, and data separately (col. 2, lines 16-32).

For at least these reasons, Applicants submit that claim 45 is patentable over Khacherian et al. and Koning et al., whether taken alone or in any reasonable combination. Claims 46-66 depend from claim 45 and are, therefore, patentable over Khacherian et al. and Koning et al. for at least the reasons given with regard to claim 45.

Amended independent claim 67 is directed to a switch fabric in a switching device having a plurality of line cards and a switch fabric therebetween for transferring data packets. The switch fabric comprises a plurality of first stage crossbars in a first stage, each first stage crossbar having a plurality of input ports and a plurality of output ports, each input port having a first request spray engine to receive a plurality of request signals associated with a destination line card and spray the request signals to different ones of the output ports in the same first stage crossbar; a plurality of second stage crossbars in a second stage, each second stage crossbar having a plurality of input ports and a plurality of output ports, each input port having a second request spray engine to receive one of the request signals from one of the first stage crossbars and send the request signal to one of the output ports in the same second stage crossbar; and a plurality of third stage crossbars in a third stage, each third stage crossbar having a plurality of input ports and a plurality of output ports, each input port having a third request spray engine to receive one of the request signals from one of the second stage crossbars and send the request

signal to one of the output ports in the same third stage crossbar.

Neither Khacherian et al. nor Koning et al., whether taken alone or in any reasonable combination, discloses or suggests the combination of features recited in claim 67. For example, neither Khacherian et al. nor Koning et al. discloses or suggests a switch fabric that comprises, among other things, a plurality of first stage crossbars in a first stage, where each first stage crossbar has a plurality of input ports and a plurality of output ports, and each input port has a first request spray engine to receive a plurality of request signals associated with a destination line card and spray the request signals to different ones of the output ports in the same first stage crossbar. Khacherian et al. does not disclose a switch fabric with first, second, and third stage crossbars and, therefore, cannot disclose or suggest first stage crossbars, as required by claim 67. Koning et al. discloses a multistage switch (col. 2, lines 37-43), but does not disclose or suggest that each input port of a first stage crossbar has a first request spray engine to receive a plurality of request signals associated with a destination line card and spray the request signals to different ones of the output ports in the same first stage crossbar, as required by claim 67.

For at least these reasons, Applicants submit that claim 67 is patentable over Khacherian et al. and Koning et al., whether taken alone or in any reasonable combination. Claim 85 depends from claim 67 and is, therefore, patentable over Khacherian et al. and Koning et al. for at least the reasons given with regard to claim 67.

Amended independent claim 68 is directed to a line card in a switching device for transferring data packets, wherein the switching device includes a plurality of line cards. The line card comprises a request generator to generate a request signal to be transmitted to a destination line card in order to receive a grant signal authorizing transferring of data to the

destination line card; and a data cell transmitter to provide a data cell to be transmitted to the destination line card upon receipt of the grant signal from the destination line card, where a request signal and a data cell are transmitted together in a single data transfer unit.

Neither Khacherian et al. nor Koning et al., whether taken alone or in any reasonable combination, discloses or suggests the combination of features recited in claim 68. For example, neither Khacherian et al. nor Koning et al. discloses or suggests a request signal and a data cell that are transmitted together in a single data transfer unit. Instead, Khacherian et al. discloses a request to release signal and a discrete information unit that are transmitted separately (col. 4, lines 33-55). Similarly, Koning et al. discloses a request signal and data that are transmitted separately (col. 2, lines 16-32).

For at least these reasons, Applicants submit that claim 68 is patentable over Khacherian et al. and Koning et al., whether taken alone or in any reasonable combination.

Amended independent claim 69 is directed to a switching device for transferring data. The switching device comprises a source line card and a destination line card including a grant generator to generate and transmit a grant signal to the source line card to authorize the source line card to transfer data to the destination line card. The source line card includes a data cell transmitter to transfer a data cell to the destination line card upon receiving the grant signal at the source line card. The switching device also comprises a switching fabric coupled to the source line card and the destination line card for receiving the grant signal from the destination line card and switching the grant signal to the source line card, and for receiving the data cell from the source line card and switching the data cell to the destination line card, where the switching fabric is configured to transmit a grant signal and a data cell together in a single data transfer

unit.

Neither Khacherian et al. nor Koning et al., whether taken alone or in any reasonable combination, discloses or suggests the combination of features recited in claim 69. For example, neither Khacherian et al. nor Koning et al. discloses or suggests a switching fabric that is configured to transmit a grant signal and a data cell together in a single data transfer unit. Instead, Khacherian et al. discloses a switch fabric that transmits a grant to release signal and a discrete information unit separately (col. 4, lines 33-55). Similarly, Koning et al. discloses a multistage switch that transmits a grant signal and data separately (col. 2, lines 16-32).

For at least these reasons, Applicants submit that claim 69 is patentable over Khacherian et al. and Koning et al., whether taken alone or in any reasonable combination.

Amended independent claim 70 is directed to a method for transferring data between line cards in a router, where the router has a plurality of line cards and a switching fabric coupled to the line cards. The method comprises transmitting a request signal from a source line card to a destination line card through the switching fabric; upon receiving the request signal at the destination line card, sending a grant signal from the destination line card to the source line card responsive to the request signal to authorize the source line card to transfer data to the destination line card; transferring a data cell from the source line card to the destination line card in response to the grant signal received at the source line card; and transferring, by the switching fabric, at least two of a request signal, a grant signal, or a data cell together in a single data transfer unit.

Neither Khacherian et al. nor Koning et al., whether taken alone or in any reasonable combination, discloses or suggests the combination of features recited in claim 70. For example, neither Khacherian et al. nor Koning et al. discloses or suggests transferring, by a switching

fabric, at least two of a request signal, a grant signal, or a data cell together in a single data transfer unit. Instead, Khacherian et al. discloses a switch fabric that transmits a request to release signal, a grant to release signal, and a discrete information unit separately (col. 4, lines 33-55). Similarly, Koning et al. discloses a multistage switch that transmits a request signal, a grant signal, and data separately (col. 2, lines 16-32).

For at least these reasons, Applicants submit that claim 70 is patentable over Khacherian et al. and Koning et al., whether taken alone or in any reasonable combination. Claims 71-79 depend from claim 70 and are, therefore, patentable over Khacherian et al. and Koning et al. for at least the reasons given with regard to claim 70.

Amended independent claim 80 is directed to a method for controlling the transfer of data packets through a switching device having a plurality of line cards and a switch fabric therebetween for transferring data packets. The method comprising transferring data packets and flow control together on a same path through the switching device.

Neither Khacherian et al. nor Koning et al., whether taken alone or in any reasonable combination, discloses or suggests the combination of features recited in claim 80. For example, neither Khacherian et al. nor Koning et al. discloses or suggests transferring data packets and flow control together on a same path through a switching device. Instead, Khacherian et al. discloses a request to release signal, a grant to release signal, and a discrete information unit that are transmitted separately (col. 4, lines 33-55). Similarly, Koning et al. discloses a request signal, a grant signal, and data that are transmitted separately (col. 2, lines 16-32).

For at least these reasons, Applicants submit that claim 80 is patentable over Khacherian et al. and Koning et al., whether taken alone or in any reasonable combination.

Independent claim 81 is directed to a method for controlling the transfer of a data packet through a switching device having a plurality of line cards and a switching fabric therebetween for transferring data packets, where each line card includes an input section including one or more input ports and an output section including one or more output ports. The method comprises generating a request flow control message at a source line card to request authorization for a transfer of the data packet from the source line card to the destination line card; transferring the request flow control message from the input section of the source line card to the output section of the destination line card using the switching fabric; generating a grant flow control message at a destination line card for the data packet; transferring the grant flow control message from the output section of the destination line card to the input section of the destination line card; transferring the grant flow control message from the input section of the destination line card to the output section of the source line card using the switching fabric; receiving the grant flow control message on the output section of the source line card and transferring the grant flow control message to the input section of the source line card; and upon receipt of the grant flow control message at the input section of the source line card, transferring the data packet from the source line card to the destination line card using the switching fabric.

Neither Khacherian et al. nor Koning et al., whether taken alone or in any reasonable combination, discloses or suggests the combination of features recited in claim 81. For example, neither Khacherian et al. nor Koning et al. discloses or suggests transferring a grant flow control message from an output section of a destination line card to an input section of the destination line card or receiving the grant flow control message on an output section of a source line card and transferring the grant flow control message to an input section of the source line card.

Khacherian et al. and Koning et al. do not disclose anything similar to these features.

For at least these reasons, Applicants submit that claim 81 is patentable over Khacherian et al. and Koning et al., whether taken alone or in any reasonable combination.

Independent claim 82 is directed to a method for controlling the transfer of a data packet through a switching device having a plurality of line cards and a switching fabric therebetween for transferring data packets, where each line card includes an input section including one or more input ports and an output section including one or more output ports. The method comprises generating flow control messages at the source line card and destination line card to authorize a transfer of the data packet from the source line card to the destination line card; and transferring the flow control messages between the source and destination line cards including transferring flow control messages from the input section of a line card to the output section of a different line card using the switching fabric, and transferring flow control messages from the output section of a line card to the input section of a same line card without using the switching fabric.

Neither Khacherian et al. nor Koning et al., whether taken alone or in any reasonable combination, discloses or suggests the combination of features recited in claim 82. For example, neither Khacherian et al. nor Koning et al. discloses or suggests transferring flow control messages from the output section of a line card to the input section of a same line card without using the switching fabric. Khacherian et al. and Koning et al. do not disclose anything similar to these features.

For at least these reasons, Applicants submit that claim 82 is patentable over Khacherian et al. and Koning et al., whether taken alone or in any reasonable combination. Claim 84

depends from claim 82 and is, therefore, patentable over Khacherian et al. and Koning et al. for at least the reasons given with regard to claim 82.

Independent claim 83 is directed to a method for controlling the transfer of a data packet through a switching device having a plurality of line cards and a switching fabric therebetween for transferring data packets. The method comprises generating flow control messages at the source line card and destination line card to authorize a transfer of the data packet from the source line card to the destination line card, each flow control message only including a source and destination line card address; and transferring the flow control messages between the source and destination line cards using the switching fabric where minimal data buffering is performed by the switching fabric in processing the flow control messages.

Neither Khacherian et al. nor Koning et al., whether taken alone or in any reasonable combination, discloses or suggests the combination of features recited in claim 83. For example, neither Khacherian et al. nor Koning et al. discloses or suggests generating flow control messages at the source line card and destination line card to authorize a transfer of the data packet from the source line card to the destination line card, where each flow control message only includes a source and destination line card address. Instead, Khacherian et al. discloses a request signal and a grant signal that include identification of a respective input source port, priority pertaining to a discrete information unit, and its destination output port (col. 4, lines 17-20). Koning et al. also does not disclose or suggest the flow control messages of claim 83, where each flow control message only includes a source and destination line card address.

For at least these reasons, Applicants submit that claim 83 is patentable over Khacherian et al. and Koning et al., whether taken alone or in any reasonable combination.

Amended independent claim 86 is directed to a switching device for transferring data packets. The switching device comprises one or more source line cards, each including a request generator to generate a request signal to be transmitted in order to obtain an authorization to transmit data; one or more destination line cards, each including a grant generator to generate and send back a grant signal to a source line card in response to the request signal received at the destination line card to authorize the source line card to transmit a data cell to the destination line card; and a plurality of planes of switching elements coupling the one or more source line cards and the one or more destination line cards, each plane being connected to the one or more source line cards and the one or more destination line cards and being configured to receive and transmit the request signal, the grant signal, and the data cell to the appropriate line cards.

Neither Khacherian et al. nor Koning et al., whether taken alone or in any reasonable combination, discloses or suggests the combination of features recited in claim 86. For example, neither Khacherian et al. nor Koning et al. discloses or suggests a plurality of planes of switching elements coupling the one or more source line cards and the one or more destination line cards, where each plane is connected to the one or more source line cards and the one or more destination line cards and is configured to receive and transmit the request signal, the grant signal, and the data cell to the appropriate line cards. Khacherian et al. discloses nothing similar to a plurality of planes of switching elements. Koning et al. discloses a multistage switch (col. 4, lines 9-32), but does not disclose or suggest a plurality of planes of switching elements coupling the one or more source line cards and the one or more destination line cards, where each plane is connected to the one or more source line cards and the one or more destination line cards and is configured to receive and transmit the request signal, the grant signal, and the data cell to the

appropriate line cards, as required by claim 86.

For at least these reasons, Applicants submit that claim 86 is patentable over Khacherian et al. and Koning et al., whether taken alone or in any reasonable combination.

Independent claim 87 is directed to a method for recovering from a failure in a switching device including one or more source line cards and destination line cards, where the switching device transfers data packets through a network. The method comprises providing plural switching planes between each source line card and destination line card; generating flow control messages for authorizing a transfer of a packet from a source line card to a destination line card; spraying the flow control messages over each of the plural switching planes; and spraying data packets over switching planes on which flow control authorization messages are received.

Neither Khacherian et al. nor Koning et al., whether taken alone or in any reasonable combination, discloses or suggests the combination of features recited in claim 87. For example, neither Khacherian et al. nor Koning et al. discloses or suggests spraying flow control messages over each of a plurality of switching planes or spraying data packets over switching planes on which flow control authorization messages are received. Khacherian et al. and Koning et al. disclose nothing similar to these features.

For at least these reasons, Applicants submit that claim 87 is patentable over Khacherian et al. and Koning et al., whether taken alone or in any reasonable combination.

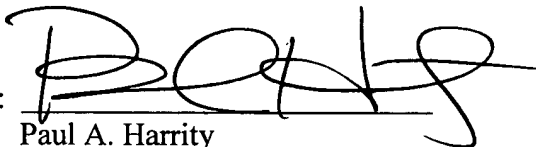
In view of the foregoing, Applicants respectfully request examination and allowance of pending claims 44-87.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper,

including extension of time fees, to Deposit Account No. 50-1070 and please credit any excess fees to such deposit account.

Respectfully submitted,

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